

ABSTRACT OF THE INVENTION

An automatic axle engagement system utilizes wheel speed sensors, engine control, and braking control to provide optimal engagement of a front drive axle to provide all wheel drive under poor driving conditions. The system includes a transfer case that is coupled to a power source and which has output shafts for front and rear drive axles. The engine provides torque to the transfer case via an input shaft. Wheel sensors generate wheel speed signals that are transmitted to a controller, which determined whether or not there is wheel slip. The controller initiates a shift to drivingly engage the front drive axle if there is wheel slippage by controlling one or both of the output torque or axle braking forces to bring rotational speeds of the input shaft and the rear axle output shaft within a predetermined speed range.

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